

WHAT IS CLAIMED IS:

1. A liquid discharge recording head cartridge comprising:

5 a first plate having liquid supply ports opened for supply liquid;

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10 a recording element base plate provided with discharge ports for discharging liquid, a member for forming liquid flow paths to conduct liquid to said discharge ports for discharging liquid, and recording elements for generating energy to be utilized for discharging said liquid from said discharge ports, and fixed to aid first plate for inducing liquid from said liquid supply ports;

15 a recording element unit provided with a wiring board for providing signals for said recording element base plate in accordance with recording images; and

a liquid supply unit having liquid supply paths formed therefor to conduct liquid supplied from tanks containing liquid to liquid inlet ports, wherein

20 said liquid supply unit is provided with a mechanically coupling portion, and the leading face of said mechanically coupling portion is positioned on the face having said liquid inlet ports opened thereto;

25 to said first plate, said liquid supply ports are open each in the position corresponding to the position of said liquid inlet ports;

said liquid inlet ports of said liquid supply unit

and said liquid supply ports of said first plate are coupled with a joint sealing member being placed between them with holes on the positions corresponding to the opening positions of both of said supply unit  
5 and supply ports, and a coupling member is fitted into said mechanically coupling portion to enable said first plate to abut against said mechanically coupled portion of said liquid supply unit, and then, the head of said coupling member engages with the screw retaining  
10 portion provided for said first plate to couple said first plate and said liquid supply unit closely under pressure; and

said wiring board is installed on the face on the side opposite to the abutting face against said liquid  
15 supply unit of said first plate, and, further, folded to the side face on the different side, and said screw retaining portion is provided outside the portion having said wiring board installed thereon.

20 2. A liquid discharge recording head cartridge according to Claim 1, wherein said carriage of a liquid discharge recording head main body provided with a carrying mechanism for carrying a recording medium in one direction (direction Y), and a carriage enables  
25 said liquid discharge surface to be held to face the recording surface of said recording medium and moved in the direction (direction X) orthogonal to the carrying

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said recording medium, and further comprises:

an abutting portion in the direction X, an  
abutting portion in the direction Y, and an abutting  
portion in the direction Z being used for positioning  
at the time of installation on said carriage.

3. A liquid discharge recording head cartridge  
according to Claim 2, wherein said abutting portion in  
the direction X is provided for said liquid supply  
unit, and said first plate is provided with the  
referential surface in the direction X, and said liquid  
supply unit and said first plate are coupled in a state  
of being positioned with said referential surface in  
the direction X and said abutting portion in the  
direction X abutting against each other.

4. A liquid discharge recording head cartridge  
according to Claim 2, wherein said abutting portion in  
the direction Y is provided for said liquid supply  
unit, and said first plate is provided with the  
referential surface in the direction Y, and said liquid  
supply unit and said first plate are coupled in a state  
of being positioned with said referential surface in  
the direction Y and said abutting portion in the  
direction Y abutting against each other.

5. A liquid discharge recording head cartridge

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according to Claim 2, wherein said mechanical coupling portion is a screw retaining boss, and said screw retaining boss is formed so as to keep the tolerance of the upper face thereof to be within a ranged of  
5 designated tolerance with respect to the abutting face of said abutting portion in the direction Z.

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6. A liquid discharge recording head cartridge according to Claim 1, wherein the contacting face of  
10 said first plate with said liquid supply unit under pressure is in contact with said liquid supply unit only by the contact portion through the contacting part of said mechanical coupling portion, and the portion of said joint sealing member having said liquid inlet  
15 ports opened thereto.

7. A liquid discharge recording head cartridge according to Claim 1, wherein a plurality of said liquid supply ports are arranged and distributed almost  
20 in one line and opened for said first plate, and said mechanical coupling portions are arranged in two end portions on the central line of the array of said liquid supply ports.

25 8. A liquid discharge recording head cartridge according to Claim 1, wherein said first plate is formed by ceramic material.



14. A liquid discharge head cartridge comprising:  
5 a recording element unit including a plate member  
provided with liquid supply paths for supplying liquid  
to a recording element base plate for performing  
recording operation by discharging liquid;

said liquid supply unit portion and said recording  
25 element unit are adhesively bonded with each other for  
coupling on the bonding face portions other than the  
locations having said elastic sealing member arranged

said liquid supply unit portion and said recording  
25 element unit are adhesively bonded with each other for  
coupling on the bonding face portions other than the  
locations having said elastic sealing member arranged

in compression.

15. A liquid discharge recording head cartridge according to Claim 14, wherein said elastic sealing member is provided with ribs on the portion facing one end portion of the liquid supply paths of said recording element unit to surround each opening end portion of said liquid flow paths, while abutting against said portion.

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16. A liquid discharge recording head cartridge according to Claim 14, wherein said elastic sealing member is formed by chlorinated butyl rubber.

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17. A liquid discharge recording head cartridge according to Claim 14, wherein said elastic sealing member provides the contact pressure of 5 (N) or more and 30 (N) or less.

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18. A liquid discharge recording head cartridge according to Claim 14, wherein the plate member of said recording element unit is formed by either one of silicon, alumina, aluminum nitride, silicon carbide, molybdenum, and tungsten.

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19. A liquid discharge recording head cartridge according to Claim 14, wherein said liquid supply unit

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5           20. A liquid discharge recording head cartridge according to Claim 19, wherein said liquid supply unit portion and said recording unit are adhesively bonded on plural locations for coupling.

22. A liquid discharge recording head cartridge according to Claim 14, wherein the contact face of said liquid supply unit portion is given a reforming process.

23. A liquid discharge recording head cartridge according to Claim 22, wherein said reforming process  
25 is a high frequency corona surface treatment or an oxygen plasma treatment.

24. A liquid discharge recording head cartridge according to Claim 14, wherein said recording element base plate is provided with electrothermal converting devices for heating said liquid for recording use to be discharged.

25. A liquid discharge recording head cartridge comprising:

discharge ports for discharging liquid;

10 a first base plate having electrothermal converting devices provided therefor to discharge liquid from said discharge ports;

a second base plate provided with liquid supply paths for sending liquid to grooves arranged on said

15 first base plate corresponding to said electrothermal converting devices;

a flow path formation member provided with flow paths for sending liquid to said liquid supply paths on said second base plate; and

20 an elastic member provided for the bonding portion between said second base plate and said flow path formation member for sealing against the outside portion of the communicating portion having said liquid supply paths and said flow paths communicated, wherein

25 a space formed by said second base plate and the outer circumferential portion of said flow paths of said flow path formation member is filled in by

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26. A liquid discharge recording head cartridge  
5 according to Claim 25, wherein cut-off portions are  
formed for said elastic member to be communicated with  
said space.

28. A liquid discharge recording head cartridge  
15 according to Claim 25, wherein said cartridge is  
provided with electrothermal converting devices for  
generating thermal energy to be used for discharging  
ink.

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30. A liquid discharge recording head cartridge according to Claim 25, wherein adhesive agent is filled

in the contact portion between said second base plate and the outer circumference of said flow paths of said flow path formation member for sealing said communicating portion against the outside portion.

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31. A liquid discharge recording head cartridge according to Claim 30, wherein adhesive agent is filled in said space.

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32. A liquid discharge recording head cartridge according to Claim 30, wherein said adhesive agent is filled in said space from said cut-off portions of said elastic member.

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33. A liquid discharge recording head cartridge according to Claim 30, wherein said adhesive agent is filled in said space from said filling grooves formed for said second base plate.

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34. An elastically deformable sealing member inclusively installed between the abutting faces of a pair of coupling members, having respectively plural pairs of liquid passages to be connected with each other, and sealing the circumference of ports of said plural pairs of liquid passages opened to these abutting faces in the facing state, respectively, comprising:

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a mat portion having satin surface extended along said abutting faces; and

a plurality of sealing portions extruded from said mat portion in circular to surround the circumference of plural pair of said ports, each having flat and smooth surface, respectively.

35. A sealing member according to Claim 34, wherein the center line average roughness of said satin surface of said mat portion is within a range of 10 to 50  $\mu\text{m}$ .

36. A sealing member according to Claim 34, wherein the center line average roughness of said flat and smooth surface of said sealing portion is 10  $\mu\text{m}$  or less.

37. A sealing member according to Claim 34, wherein said sealing member is formed by chlorinated butyl rubber having hardness (JIS A) within a range of 30 to 50.

38. A liquid supply unit comprising:  
a pair of coupling members having plural pairs of liquid passages respectively to be connected with each other; and

a sealing member inclusively installed between the

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abutting faces of these coupling members, having  
respectively plural paris of liquid passages to be  
connected with each other, and sealing the  
circumference of ports of said plural pairs of liquid  
5 passages opened to these abutting faces in the facing  
state, said openings of said sealing member forming  
communicating passages of said liquid passages, wherein  
said sealing member comprises a mat portion having  
satin surface; and a plurality of sealing portions  
10 extruded from said mat portion in circular to surround  
the circumference of said openings of the sealing  
member, each having a flat and smooth surface,  
respectively, and  
said sealing portions are in contact with said  
15 abutting faces of said coupling member under pressure.

39. A liquid discharge head cartridge comprising:  
a liquid tank connecting unit having a plurality  
of liquid flow paths formed therefor;  
20 a liquid discharge head provided with a plurality  
of liquid supply paths communicative with said  
plurality of liquid flow paths, a plurality of  
discharge ports communicated these liquid supply paths,  
and a plurality of discharge energy generating portions  
25 for discharging liquid from these discharge ports; and  
a sealing member inclusively installed between the  
abutting faces of said liquid tank connection portion

and said liquid discharge head abutting against each other, having openings corresponding to ports of said liquid flow paths and said liquid supply paths opened to these abutting faces in a facing state, wherein

5        said sealing member comprises a mat portion extended along said abutting faces. having satin surface; and a plurality of sealing portions extruded from said mat portion in circular to surround the circumference of said openings of said sealing member,  
10        each having a flat and smooth surface, respectively, and said sealing portions are in contact with said abutting faces of said coupling member under pressure.

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15        40. A liquid discharge recording head cartridge according to Claim 39, wherein said liquid tank connecting portion is provided with a tank holder for mounting a plurality of liquid tanks for retaining liquid, respectively.

20        41. A liquid discharge recording head cartridge according to Claim 40, further comprising said liquid tanks.

25        42. A liquid discharge recording head carriage according to Claim 39, wherein the center line average roughness of said satin surface of said mat portion is within a range of 10 to 50  $\mu\text{m}$ .

43. A liquid discharge recording head cartridge according to Claim 39, wherein the center line average roughness of said flat and smooth surface of said sealing portion is 10  $\mu\text{m}$  or less.

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44. A liquid discharge recording head cartridge according to Claim 39, wherein said sealing member is formed by chlorinated butyl rubber having hardness (JIS A) within a range of 30 to 50.

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45. A liquid discharge recording head cartridge according to Claim 39, wherein the center line average roughness of the portion abutting against said liquid tank connection portion and said sealing portions of said sealing member of said liquid discharge head is 0.5  $\mu\text{m}$  or less.

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46. A liquid discharge recording head cartridge according to Claim 39, wherein a smoothing layer is formed for the abutting portion of said liquid tank connecting portion and said sealing portions of said sealing member of said liquid discharge head for smoothing the surface thereof.

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47. A liquid discharge recording head cartridge according to Claim 39, wherein said discharge energy generating portion is provided with electrothermal

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converting devices for generating thermal energy for creating film boiling in liquid to discharge liquid from said discharge ports.

- 5           48. A liquid discharge recording head cartridge according to Claim 39, wherein liquid is ink and/or processing liquid for adjusting the printability of ink with respect to a printing medium.

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